PRECAST, PRESTRESSED COLUMNS

Fig. 2.6.1 Design strength interaction curves for precast, prestressed concrete columns

Criteria
1. Minimum prestress = 225 psi
2. All strand assumed 1/2 in. diameter, $f_{pu} = 270$ ksi
3. Curves shown for partial development of strand near member end, where $f_{ps} \approx f_{we}$
4. Horizontal portion of curve is the maximum for tied columns = $0.80f_{p}$
5. $\phi = 0.9$ for $\phi P_n = 0$
   = 0.7 for $\phi P_n \geq 0.10f' c A_g$
   Varies from 0.9 to 0.7 for points between

Use of curves
1. Enter at left with applied factored axial load, $P_u$
2. Enter at bottom with applied magnified factored moment, $\delta M_u$
3. Intersection point must be to the left of curve indicating required concrete strength.

Notation
$\phi P_n$ = Design axial strength
$\phi M_n$ = Design flexural strength
$\phi P_o$ = Design axial strength at zero eccentricity
$A_g$ = Gross area of the column
$\delta$ = Moment magnifier (Sect. 10.11, ACI 318-77)

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Diagram showing interaction curves for 12 x 12 and 14 x 14 columns with 4 strands at various concrete strengths.
PRECAST, PRESTRESSED COLUMNS

Fig. 2.6.1 (cont.) Design strength interaction curves for precast, prestressed concrete columns